DETAILED ACTION

Examiner's Comments

An after-final amendment, amending claims 1, 3, 5, 14 and 20 and cancelling claims 2 and 21, was received and entered on 6/1/10.

Allowable Subject Matter

1. Claims 1, 3-6, 8-20 and 24-27 are allowed.

Setlur et al. (Appl. Phys. Lett., 69(3), p. 345) teaches a method of forming nanowires (Abst.) comprising the steps of: providing clusters (claimed agglomerated mass) of copper nanoparticles, providing a gaseous fluid of polycyclic aromatic hydrocarbons (PAH) molecules, depositing the PAH molecules onto the surface of the copper particles and assembling the copper particles to produce a linear nanowire (p. 346, right column through p. 347, left column; Fig. 3).

Oku et al. (Microelectronic Engr., 51-52, pp. 61-60) teaches a method of forming nanowires comprising the steps of: providing gold nanoparticles, providing a fluid of alpha-terpineol molecules in solution (p. 52) so that the terpineol molecules form graphite layers around the nanoparticles (Fig. 5), and assembling the nanoparticles to form a gold nanowire (Fig. 5). Oku also teaches that the nanowires are linear (Fig. 5). However, Oku teaches the use of a liquid rather than a vapor and does not fairly teach or suggest that such a method could be combined with Setlur.

Furthermore, neither Setlur nor Oku fairly teach or suggest that the nanoparticles which form the nanowire are ferromagnetic materials. With respect to claims 5 and 26, Kim (WO 03/008331) teaches that a fluorocarbon is used as the carbon source. However, there is no fair suggestion in Kim that the carbon sources taught in the Kim method could be used in either the method of Setlur or Oku.

Kim (WO 03/008331) teaches a method of forming nanotubes comprising the steps of providing metal catalyst nanoparticles (p. 13:1-2; p. 11:16-20), providing a carbon source (p. 13:3-6), wherein the carbon source is gaseous (claimed fluid of molecules) and halogenated (p. 16:11-21), and forming carbon nanotubes via vapor deposition (p. 13:7; p. 17:6-9) (claimed depositing carbon on the catalyst particles and depositing more carbon to form nanotube deposits). However, Kim also fails to teach that the

halogenated molecule source comprises a decomposed polymer. In addition, Kim fails to teach that more of the metal catalyst nanoparticles are assembled to form elongated structures.

With respect to claim 14, Harutyunyan et al. (US 7,014,737) teaches that nanotubes and nanofibers can be annealed to purify the nanotubes or nanowires by removing residual catalyst molecules (9:61-64). However, nothing in Setlur, Oku or Harutyunyan fairly teaches or suggests that the catalyst particles comprise carbon and that carbon is the impurity being removed by the annealing process.

Finally, Nolan et al. (US 5,780,101) teaches a method of forming carbon coated ferromagnetic nanoparticles (Abst., 2:54-57) wherein a carbon nanotube structure is grown from the carbon coated particles (Fig. 4, 2:45-53). However, with respect to claim 1, Nolan fails to teach that the ferromagnetic particles assemble to form a nanowire. Therefore, there is no reasonable suggestion or motivation to combine the teachings of Nolan with Setlur or Oku to arrive at a method which renders claim 1 obvious.

Thus, taken individually or in combination, none of the above cited references fairly teach or suggest all the limitations of claims 1, 5, 14, 20 or 24.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT VETERE whose telephone number is (571)270-1864. The examiner can normally be reached on Mon-Fri 9-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Robert Vetere/
Examiner, Art Unit 1712

/Michael Cleveland/

Supervisory Patent Examiner, Art Unit 1712